

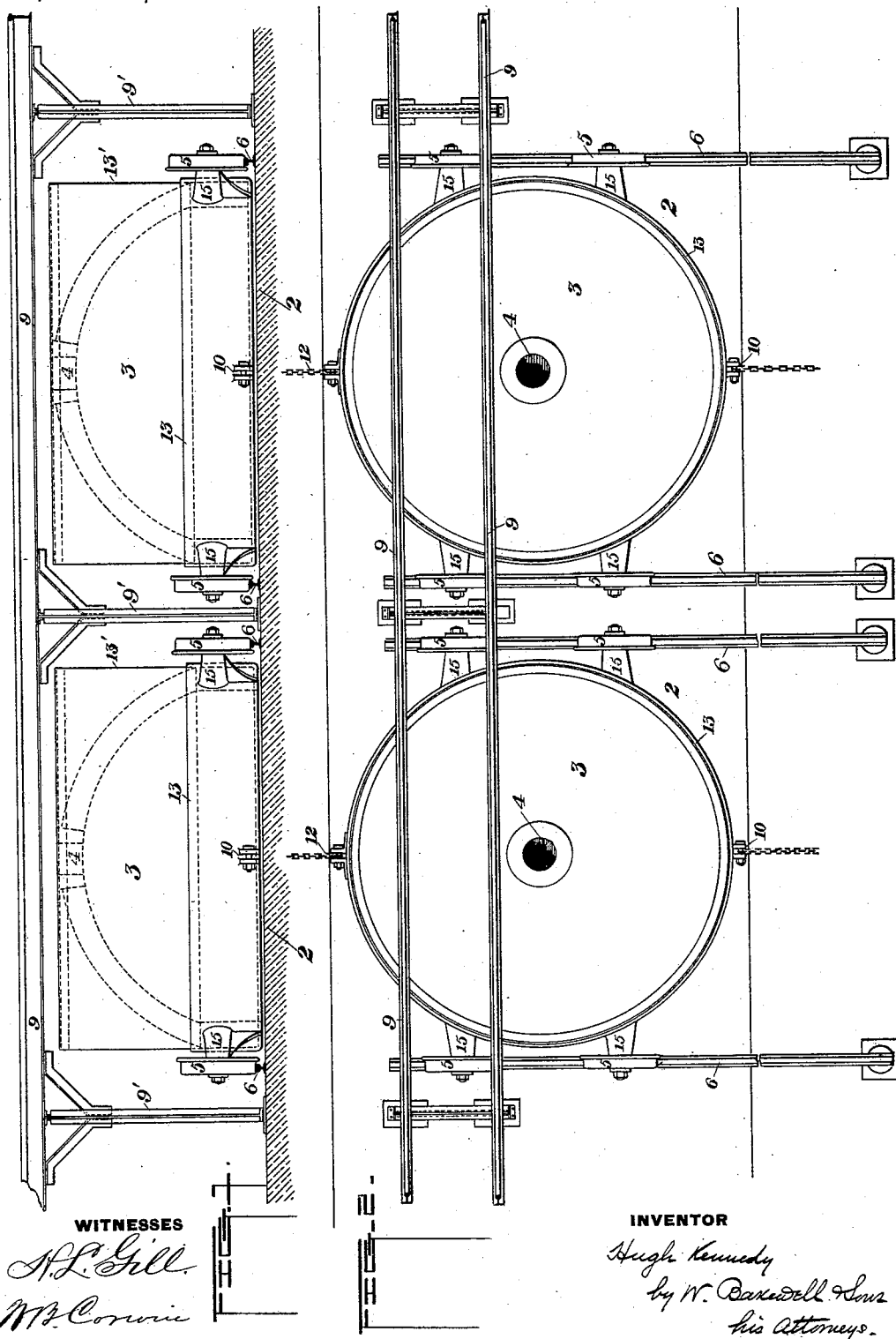
(No Model.)

3 Sheets—Sheet 1.

H. KENNEDY.
COKE OVEN.

No. 469,817.

Patented Mar. 1, 1892.



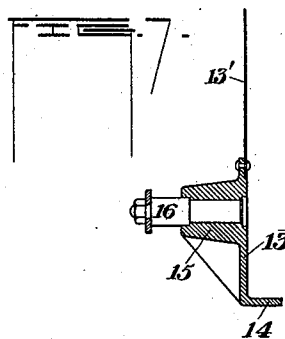
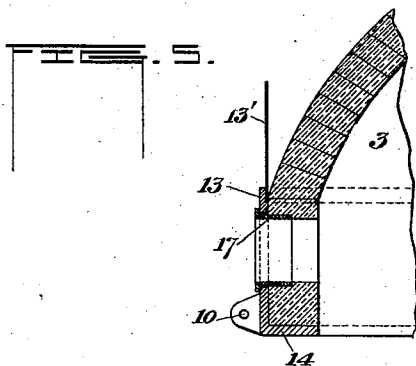
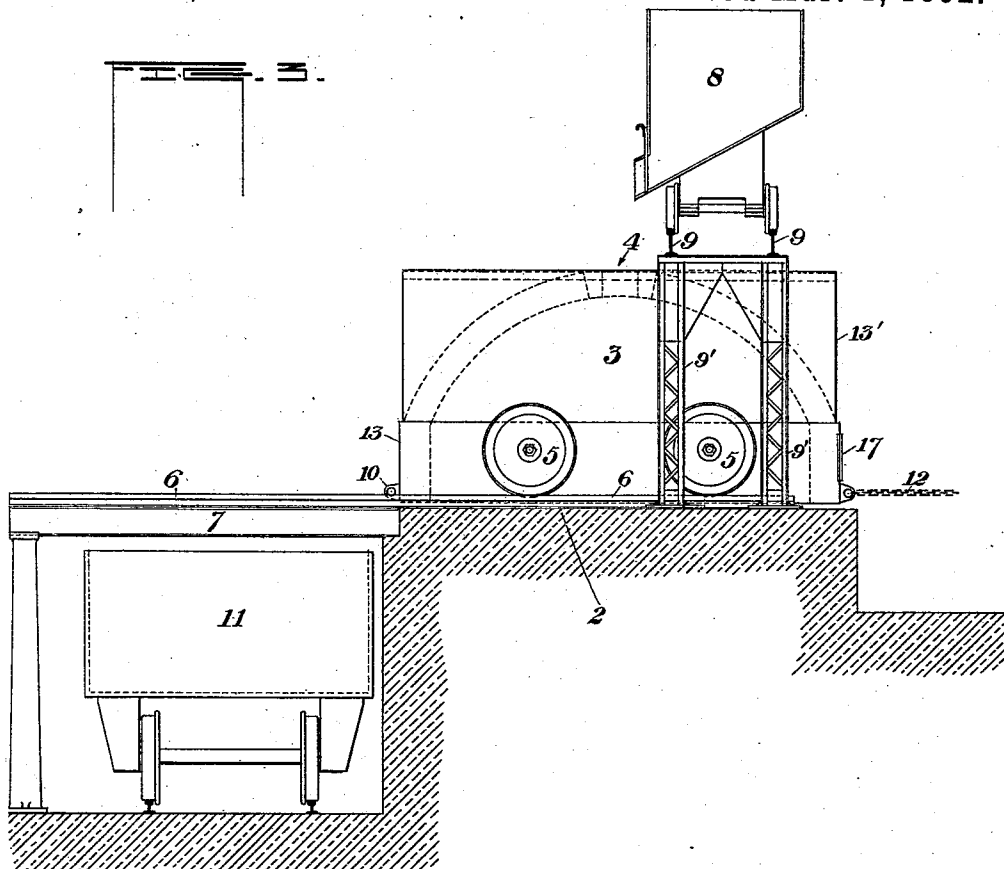
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WITNESSES

A. L. Gill
N. D. Conner

INVENTOR

Hugh Kennedy
by W. Baxendell & Sons
his Attorneys

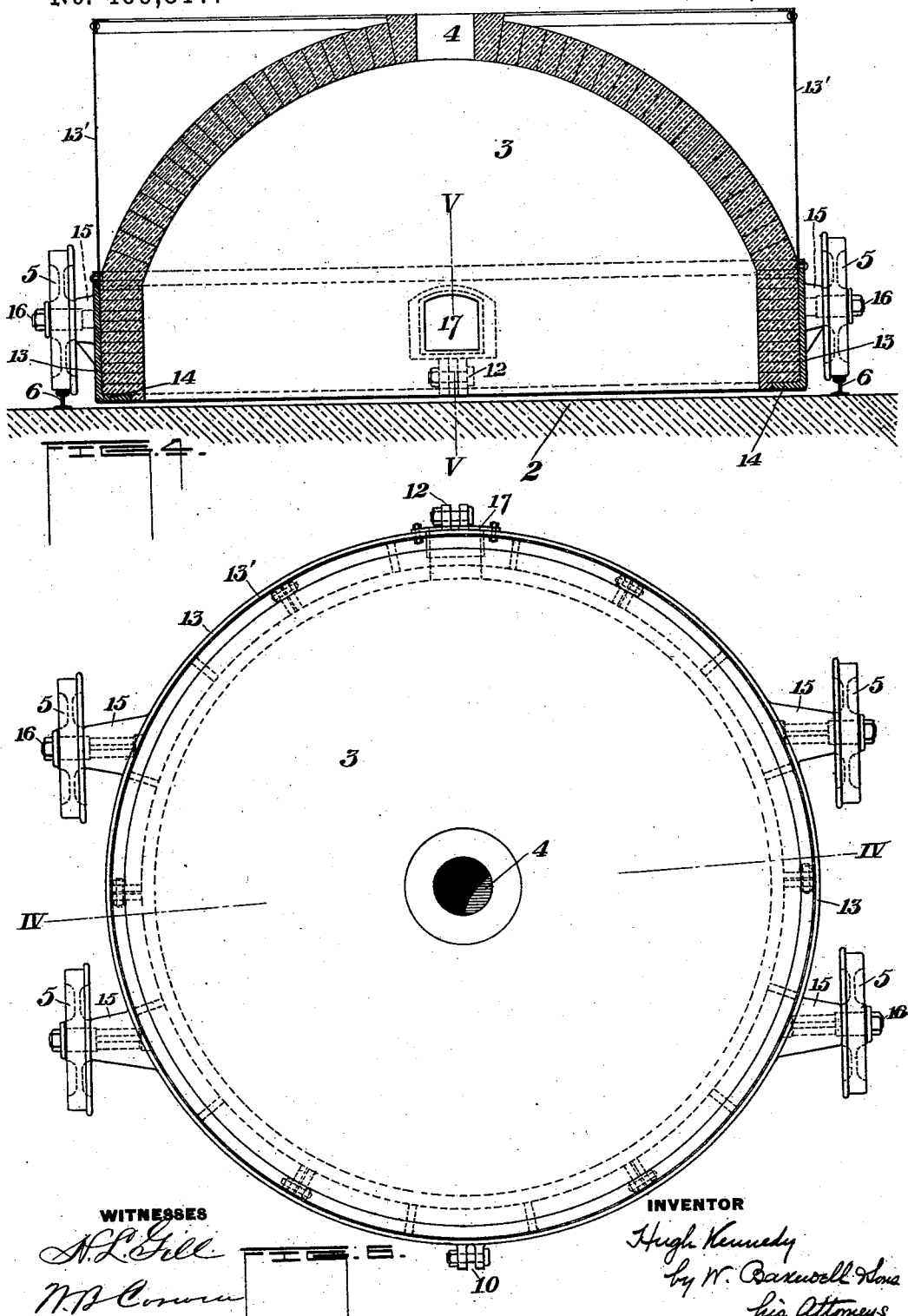
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UNITED STATES PATENT OFFICE.

HUGH KENNEDY, OF SHARPSBURG, PENNSYLVANIA.

COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 469,817, dated March 1, 1892.

Application filed November 1, 1890. Serial No. 370,038. (No model.)

To all whom it may concern:

Be it known that I, HUGH KENNEDY, of Sharpsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Coke-Ovens, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows in front elevation two of my improved coke-ovens. Fig. 2 is a plan view thereof. Fig. 3 is a side elevation thereof. Fig. 4 is an enlarged vertical section of one of the ovens, the section plane being on the line IV IV of Fig. 6. Fig. 5 is a partial section on the line V V of Fig. 4, showing the oven-door. Fig. 6 is an enlarged plan view of the oven. Fig. 7 is a sectional detail view.

Like symbols of reference indicate like parts in each.

Heretofore the common practice in making coke has been to charge the coal into an ordinary bee-hive oven built as a permanent and fixed structure, and after igniting and coking the charge to cool it by watering and then to withdraw it for use. The disadvantages attending the use of such ovens are numerous. The work of drawing the charge is very laborious to the workman and costly to the proprietors of the oven, and the sudden chilling of the oven, which results from watering the coke-oven, is not only destructive to the structure, but by requiring the coke at each charge to be reheated from a cold state to a temperature sufficient to insure the coking of the coal materially retards the coking operation and makes it necessary to consume a greater amount of coal uselessly as fuel. These disadvantages and others which will be recognized by the skilled coke-maker have led to attempts to provide ovens in which the coke could be withdrawn without watering in the oven, but hitherto such attempts generally in the line of moving the bottom of the oven with the coke thereon have not been sufficiently successful to warrant their general adoption in the art.

The object of my invention is to obviate these objections incident to the bee-hive ovens and to provide means whereby coal can be coked economically and rapidly and the coked charge withdrawn without need of watering

in the oven and without the usual manual labor which has been not only laborious in itself, but also injurious to the coke and to the oven-walls. To this end I use a coke-oven dome normally set over a coking floor or hearth, on which the charge within the oven is coked in the usual way, which oven is movable laterally, so that at the conclusion of the operation it may be moved from the hearth, dragging the charge with it over an opening at which the charge drops from within the oven. The oven is adapted then to be moved back over the hearth and to receive a new charge of coal, and as no watering in the oven or on the hearth is necessary both these parts remain hot, so that the newly-introduced charge is coked very much more rapidly than has been possible heretofore, and as the oven is saved from the sudden chilling and contraction caused by the watering operation its duration is very much prolonged.

Referring now to Figs. 3 and 4 of the drawings, 2 represents the permanent coke-oven hearth or floor, which is preferably faced on top with brick banded or otherwise firmly secured together and made as smooth as possible, so as to prevent injury when the oven is moved with the coke. 3 is the oven, consisting of a dome-shaped or bee-hive structure, preferably circular in cross-section, open at the bottom, and having a charging-hole 4 at the top. This oven is provided with wheels 5, mounted on a track 6, the rails of which are arranged on said hearth and extend beyond the same on an open frame or trestle 7, beneath which may be a track, on which cars may be placed to receive the coke discharged from the oven. The body of the oven is between the tracks and is so situate relatively to the hearth that its lower edge shall be almost in contact with the latter.

The operation of the oven is as follows: When it is situate over the hearth 2, as shown in Fig. 3, it is charged with coal, which may be introduced through the hole 4 from a car 8 on an overhead track 9, which is supported by posts 9'. The crevice between the lower edge of the oven and the hearth then may be luted with clay, and, the charge having been fired, the coking operation proceeds in the usual way. At the end of the operation suitable traction mechanism—such as a chain op-

erated by a drum—is attached to the oven at 10 and the oven is drawn on its wheels from the hearth over the trestle 7, dragging the coked charge with it on the hearth. When 5 the oven passes the hearth, the coke falls from within it into a car or other receptacle 11, situate below the trestle, on the bottom of which may be some water, the steam from which will cool the coke, or the coke may be 10 cooled in the car by discharging water on it. This operation of discharging the coke occupies but a short time, and at its conclusion the oven is drawn back over the hearth by a traction-chain 12 and may be at once re- 15 charged with coal and luted at the base, after which the coking proceeds as before. At the beginning of the second coking operation both the walls of the oven and the hearth are red-hot, the hearth being so thick and substantial that its heat is not easily lost by ra- 20 diation, so that the coking of the coal begins very rapidly and is much more thorough and produces a better quality of coke than where the oven is cold at the beginning of the work. 25 In moving the oven to and from the hearth its weight is supported by the wheels, the friction of motion of which is so small that but little mechanical power is required for the operation of the apparatus. This fact con- 30 stitutes an item of practical economy which enhances greatly the merits of the invention.

In Figs. 1 and 2 I show a plant consisting of two such ovens set side by side, and it is obvious that I may make the hearth 2 as long 35 as may be wished and may use any number of the ovens. It is desirable in practice to have in a plant one or more extra oven-domes, so that if any of the ovens may need repair it may be drawn off the hearth and the extra 40 oven substituted, in which case the work of coking need not be interrupted and the hearth need not to be allowed to cool.

In Figs. 4, 5, and 6 I show the details of construction of the oven-dome as I prefer to make 45 it; but I wish it to be understood that my invention is not limited strictly thereto, since changes may be made in the form and relative arrangement of the parts. The coke-oven dome is built of brick-work in the man- 50 ner illustrated. The lower part, which, after the manner of the ordinary bee-hive oven, is cylindrical in form, is built in a cast-iron frame or jacket 13, having at its lower end an inwardly-extending supporting-flange 14. 55 For convenience in manufacture this jacket is preferably made in sections bolted or riveted together, as shown, and at four opposite

places on the jacket are cast sockets 15, in which I fix axles 16, on which the wheels 5 are journaled, Fig. 7. One of the sections 60 is also cast with an opening for the reception of a door-frame 17, Figs. 4 and 5. For the purpose of preventing loss of heat by radiation from the dome I prefer to employ a cylindrical metal shell 13', which extends up- 65 wardly from the frame 13 to about the level of the top of the dome and to fill in the space within the shell with a non-heat-conducting material—such as clay, mineral wool, or other suitable substance—which contributes mate- 70 rially to the efficiency of the oven.

Many changes in the shape of the oven and the means for imparting lateral motion to it and for guiding it in such motion will suggest themselves. Such changes I intend to cover 75 by the broad claims of this specification.

I am aware that coke-ovens have been devised in which the hearth carrying the coked charge is moved from the oven. My oven is superior in operation to such ovens in which 80 the hearth, in order that it may be movable with proper facility, must be made so light that it will easily lose its heat when removed from the oven.

I claim—

1. In apparatus for coking coal, the combination of a stationary hearth on which the charge to be coked rests, an oven open at the bottom and set over said hearth with its sides extending to about the level thereof, and 90 means for moving the oven laterally on the hearth, whereby the coked charge is dragged by the oven and removed from the hearth, said apparatus having a dumping place or drop in the path of motion of the oven, sub- 95 stantially as and for the purposes described.

2. In apparatus for coking coal, the combination of a stationary hearth on which the charge to be coked rests, an oven open at the bottom, and set on wheels over said hearth, 100 with its sides extending to about the level thereof, means for moving the oven laterally on the hearth, and a dumping place or drop in the path of motion of the oven, whereby the coked charge is dragged by the oven and re- 105 moved from the hearth, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 22nd day of October, A. D. 1890.

HUGH KENNEDY.

Witnesses:

W. B. CORWIN,
THOMAS W. BAKEWELL.